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Search Results -

Term	Documents
INCREASE.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	1551825
INCREASES.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	957994
PRODUCTION.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	1246155
PRODN.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	513306
YIELD.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	614589
YIELDS.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	245222
(2 SAME (INCREASE ADJ (YIELD OR PRODUCTION))) .USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	5

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Database:

12 same increase (production or yield)

Refine Search:

Clear

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Today's Date: 5/17/2001

DB Name	Query	Hit Count	Set Name
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	12 same increase (production or yield)	5	<u>L4</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	12 and increase (production or yield)	22	<u>L3</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	secondary metabolite same fung\$	189	<u>L2</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	secondary metabolite and fung\$	475	<u>L1</u>

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Search Results -

Term	Documents
INCREASE.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	1551825
INCREASES.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	957994
PRODUCTION.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	1246155
PRODN.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	513306
YIELD.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	614589
YIELDS.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	245222
(13 SAME (INCREASE ADJ (YIELD OR PRODUCTION))).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	73

Database:

US Patents Full-Text Database
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Refine Search:

113 same increase (production or yield)

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Today's Date: 5/17/2001

<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l13 same increase (production or yield)	73	<u>L14</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	penicillin or isopenicillin N	22084	<u>L13</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l9 and (fungus or fungi)	14	<u>L12</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	aflatoxin same increase (production or yield)	2	<u>L11</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	sterigmatocystin same increase (production or yield)	0	<u>L10</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	aflatoxin same (increase production or yield)	35	<u>L9</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	aflatoxin	747	<u>L8</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l6 and l1	3	<u>L7</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	sterigmatocystin	26	<u>L6</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and increase (production or yield)	45	<u>L5</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l3 and l1	1	<u>L4</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	interfere same biosynthetic pathway	29	<u>L3</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and modulate gene expression	1	<u>L2</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	secondary metabolite and (fungus or fungi)	388	<u>L1</u>

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Search Results -

Term	Documents
AAD34558	0
AAD34558S	0
AAD34564	0
AAD34564S	0
(AAD34558 OR AAD34564).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	0

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<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	aad34558 or aad34564	0	<u>L10</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	18 and increase (production or yield)	9	<u>L9</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	11 and (lovastatin or patulin)	37	<u>L8</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	aspergillus nidulans and (rho1 or rsr1)	1	<u>L7</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	15 and saccharomyces	0	<u>L6</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	pump1 or pump2	26	<u>L5</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	11 and tpk2	1	<u>L4</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	express\$ tpk2	0	<u>L3</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	11 and express\$ tpk2	0	<u>L2</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	aspergillus terreus	489	<u>L1</u>

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Term	Documents
INCREASE.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	1551832
INCREASES.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	957995
PRODUCTION.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	1246155
PRODN.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	513306
YIELD.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	614591
YIELDS.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	245223
(16 AND (INCREASE ADJ (YIELD OR PRODUCTION))) .USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	20

Database:

US Patents Full-Text Database
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JPO Abstracts Database
EPO Abstracts Database
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IBM Technical Disclosure Bulletins

116 and increase (production or yield)

Refine Search:

[Clear](#)**Search History****Today's Date: 5/19/2001**

<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l16 and increase (production or yield)	20	<u>L17</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	aspergillus and secondary metabolite	147	<u>L16</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	secondary metabolite same saccharomyces cerevisiae	1	<u>L15</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	secondary metabolite same saccharomyces	3	<u>L14</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and l12	40	<u>L13</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	inhibit same express\$	15253	<u>L12</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l10 and l1	59	<u>L11</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	activat\$ same express\$	21796	<u>L10</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and activat\$	104	<u>L9</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and small molecule	9	<u>L8</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and dominant neomorphic	0	<u>L7</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and dominant positive	0	<u>L6</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and dominant negative	7	<u>L5</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and overexpress\$	28	<u>L4</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l2 and overexpress\$	4	<u>L3</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l1 and increase (production or yield)	22	<u>L2</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	secondary metabolite same fung\$	189	<u>L1</u>

Status: Path 1 of [Dialog Information Services via Modem]

Status: Initializing TCP/IP using (UseTelnetProto 1 ServiceID pto-dialog)
Trying 3106900061...Open

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Status: Signing onto Dialog

ENTER PASSWORD:

***** HHHHHHHH SSSSSSSS? *****

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Status: Connected

Dialog level 00.12.12D

Last logoff: 17may01 13:55:52

Logon file001 20may01 08:59:45

*** ANNOUNCEMENT ***

NEW FILE RELEASED

***EIU Business Magazines (File 622)

***IBISWorld Market Research (File 753)

***Investext PDF Index (File 745)

***Daily and Sunday Telegraph (London) Papers (File 756)

***The Mirror Group Publications (United Kingdom) (File 757)

***Reuters Business Insight (File 759)

UPDATING RESUMED

***Delphes European Business (File 481)

***Extel Financial Cards from Primark (File 500)

***Books In Print (File 470)

***Extel News Cards from Primark (File 501)

RELOADED

***Kompas Middle East/Africa/Mediterranean (File 585)

***Kompas Asia/Pacific (File 592)

***Kompas Central/Eastern Europe (File 593)

***Kompas Canada (File 594)

FILES REMOVED

***EconBase (File 565)

New pricing structure for Pharmaprojects (Files 128/928) from
April 1, 2001. Check Help News128 or Help News928 for further
information.

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databases within 15 minutes of transmission over the
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broad spectrum of news wires.

>>> Enter BEGIN HOMEBASE for Dialog Announcements <<<
>>> of new databases, price changes, etc. <<<

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File 1:ERIC 1966-2001/May 08
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Set Items Description
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?b 71, 434, 155, 5

20may01 08:59:58 User259980 Session D118.1
\$0.42 0.121 DialUnits File1
\$0.42 Estimated cost File1
\$0.01 TYMNET
\$0.43 Estimated cost this search
\$0.43 Estimated total session cost 0.121 DialUnits

SYSTEM:OS - DIALOG OneSearch

File 71:ELSEVIER BIOBASE 1994-2001/May W4
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File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
(c) 1998 Inst for Sci Info
File 155:MEDLINE(R) 1966-2001/May W5
(c) format only 2000 Dialog Corporation
*File 155: Medline has now updated. For further information
see Help News155.
File 5:Biosis Previews(R) 1969-2001/May W2
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Set Items Description
--- ---

?e au=busby robert

Ref	Items	Index-term
E1	1	AU=BUSBY RL
E2	4	AU=BUSBY RM
E3	0	*AU=BUSBY ROBERT
E4	2	AU=BUSBY ROBERT C
E5	1	AU=BUSBY ROBERT D
E6	6	AU=BUSBY ROBERT W
E7	1	AU=BUSBY ROD
E8	7	AU=BUSBY RW
E9	183	AU=BUSBY S
E10	1	AU=BUSBY S A
E11	15	AU=BUSBY S J
E12	28	AU=BUSBY S J W

Enter P or PAGE for more

?e au=cali brian

Ref	Items	Index-term
E1	5	AU=CALI BB
E2	8	AU=CALI BM
E3	0	*AU=CALI BRIAN
E4	4	AU=CALI BRIAN M
E5	16	AU=CALI C
E6	2	AU=CALI C M
E7	2	AU=CALI CLORINDA
E8	2	AU=CALI CM
E9	5	AU=CALI D
E10	1	AU=CALI DD
E11	22	AU=CALI F
E12	7	AU=CALI F.

Enter P or PAGE for more

?s secondary(w)metabolite and fung?

481600 SECONDARY
115549 METABOLITE
1941 SECONDARY(W)METABOLITE
632823 FUNG?

S1 541 SECONDARY(W)METABOLITE AND FUNG?

?s increase (production or yield) and s1

0 INCREASE (PRODUCTION
0 YIELD)
541 S1

S2 0 INCREASE (PRODUCTION OR YIELD) AND S1

?s increase (production or yield)

0 INCREASE (PRODUCTION
0 YIELD)

S3 0 INCREASE (PRODUCTION OR YIELD)

?s increase(w)production or yield
1516937 INCREASE
945925 PRODUCTION
588 INCREASE(W)PRODUCTION
312041 YIELD
S4 312588 INCREASE(W)PRODUCTION OR YIELD

?s s1 and s4
541 S1
312588 S4
S5 23 S1 AND S4

?rd
...completed examining records
S6 19 RD (unique items)
?t/9/all

6/9/1 (Item 1 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE
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01488179 2000160319
Statistical analysis of elicitation strategies for thiarubrine A production
in hairy root cultures of *Ambrosia artemisiifolia*
Bhagwath S.G.; Hjortso M.A.
ADDRESS: M.A. Hjortso, Department Chemical Engineering, Louisiana State
University, Baton Rouge, LA 70803, United States
EMAIL: hjortso@che.lsu.edu
Journal: Journal of Biotechnology, 80/2 (159-167), 2000, Netherlands
PUBLICATION DATE: June 23, 2000
CODEN: JBITD
ISSN: 0168-1656
PUBLISHER ITEM IDENTIFIER: S016816560000256X
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English
NO. OF REFERENCES: 29

Elicitation strategies were studied for *yield* enhancement of thiarubrine A, a *secondary* *metabolite* and a potential pharmaceutical, produced by hairy root cultures of *Ambrosia artemisiifolia*. Abiotic elicitation was performed using vanadyl sulfate solution and biotic elicitation using autoclaved cell wall filtrates of the *fungi* *Protomyces gravidus*, a pathogen of *A. artemisiifolia* and *Botrytis cinerea*. The factors considered were age of the culture, concentration of the elicitor used and the time period of exposure or contact. Statistical methods were used to determine the strength of the interaction between the various factors and their response on the *yield* of the *secondary* *metabolite*. The maximum increase in the *yield* relative to the control, 8-fold corresponding to 569 µg gsup -sup 1 of biomass, was observed when 16-day-old cultures were elicited with 50 mg lsup -sup 1 of vanadyl sulfate for a time period of 72 h. The maximum *yield* of 647 µg gsup -sup 1 was achieved when the cultures were exposed to 5 µM autoclaved cell wall filtrates of *P. gravidus* for a time period of 48 h. The *yield* increase was 3-fold in the case of elicitation with autoclaved cell wall filtrates of *B. cinerea*. The methodology used in this report can be extended to determine the optimum conditions of other elicitors. Copyright (C) 2000 Elsevier Science B.V.

DESCRIPTORS:
Elicitation; Hairy roots; Thiarubrine A; *Ambrosia artemisiifolia*

SPECIES DESCRIPTORS:
Ambrosia artemisiifolia; *Protomyces gravidus*; *Botrytis cinerea*

CLASSIFICATION CODE AND DESCRIPTION:
92.3.3.1 - PLANT SCIENCE / TISSUE CULTURE / Tissue and Organ Culture,
Micropropagation / Tissue and organ culture
92.9.1.4 - PLANT SCIENCE / BIOTECHNOLOGY / Biotechnology and Bioengineering
/ Production of useful compounds
92.16.2 - PLANT SCIENCE / TECHNIQUES / Statistics
92.1.6 - PLANT SCIENCE / BIOCHEMISTRY / Secondary Products
84.4.1 - GENETICS AND MOLECULAR BIOLOGY / VIRAL GENETICS / Plant and
Fungal Viruses

6/9/2 (Item 2 from file: 71)
DIALOG(R)File 71:ELSEVIER,BIOBASE
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00084923 94054891
Hispidospermidin, a novel phospholipase C inhibitor produced by
Chaetosphaeronema hispidulum (Cda) Moesz NR 7127: I - Screening,
taxonomy, and fermentation
Yanagisawa M.; Sakai A.; Adachi K.; Sano T.; Watanabe K.; Tanaka Y.; Okuda
T.
ADDRESS: M. Yanagisawa, Nippon Roche Research Center, 200 Kajiwara,
Kamakura, Kanagawa 247, Japan
Journal: Journal of Antibiotics, 47/1 (1-5), 1994, Japan
PUBLICATION DATE: 19940000
CODEN: JANTA
ISSN: 0021-8820
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English

A novel phospholipase C inhibitor, hispidospermidin, was discovered from a
fungal culture broth. The producing *fungus*, NR 7127, formed abundant
pycnidia on banana leaf agar under near UV light. The ostiolate pycnidia
were dark colored with a short beak possessing numerous protruding setae.
The conidiogeneous cells were phialidic. The conidia were hyaline, 1
septate, smooth and spindle-shaped. From these distinctive characteristics,
this strain was identified as Chaetosphaeronema hispidulum (Cda) Moesz of
the Coelomycetes. Hispidospermidin was produced in a 50-liter jar fermentor
containing 2% glucose, 2% potato starch, 2% Toast soya, 0.5% yeast extract,
0.25% NaCl, 0.0005% ZnSO₄ 4.7H₂O, 0.0005% CuSO₄ 4.5H₂O, 0.0005%
MnSO₄ 4.4H₂O, 0.32% CaCO₃, and 0.3% Nissan disfoam CA-115.
Fermentation was conducted at 27°C at an aeration rate of 30
liters/minute and agitated at 500 rpm for 95 hours. Maximum production
yield of hispidospermidin was observed after 72 hours. Hispidospermidin
inhibited rat brain phospholipase C at 16 µM of IC₅₀. This is the
first recorded discovery of a *secondary* *metabolite* from the genus
Chaetosphaeronema.

6/9/3 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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06281979 90047071
Antibiotics: opportunities for genetic manipulation. \
Hopwood DA
John Innes Institute, Norwich, U.K.
Philosophical transactions of the Royal Society of London. Series B:
Biological sciences (ENGLAND) Aug 31 1989, 324 (1224) p549-62, ISSN
0962-8436 Journal Code: P52
Languages: ENGLISH
Document type: JOURNAL ARTICLE; REVIEW; REVIEW LITERATURE
JOURNAL ANNOUNCEMENT: 9002
Subfile: INDEX MEDICUS
New antibiotics can still be discovered by the development of novel
screening procedures. Notable successes over the last few years include the
monobactams, beta-lactamase inhibitors (clavulanic acid) and new
glycopeptides in the antibacterial field; antiparasitic agents such as
avermectins; and herbicidal antibiotics like bialaphos. In the future we
can expect the engineering of genes from 'difficult' pathogens, including
mycobacteria and *fungi*, and cancer cells, to provide increasingly useful
in vitro targets for the screening of antibiotics that can kill pathogens
and tumours. There will also be a greater awareness of the need to reveal
the full potential for antibiotic production on the part of microorganisms
by the physiological and/or genetic awakening of 'silent' genes.
Nevertheless, the supply of natural antibiotics for direct use or chemical
modification is not infinite and there will be increasing scope for
widening the range of available antibiotics by genetic engineering.
'Hybrid' antibiotics have been shown to be generated by the transfer of
genes on suitable vectors between strains producing chemically related
compounds. More exciting is the possibility of generating novelty by the

genetic engineering of the synthases that determine the basic structure of antibiotics belonging to such classes as the beta-lactams and polyketides. Research in this area will certainly *yield* knowledge of considerable scientific interest and probably also of potential applicability. In the improvement of antibiotic titre in actinomycetes, protoplast fusion between divergent selection lines has taken a place alongside random mutation and screening. In some cases the cloning of genes controlling metabolic 'bottlenecks' in *fungi* and actinomycetes will give an immediate benefit in the conversion of accumulated biosynthetic intermediates to the desired end product. However, the main impact of genetic engineering in titre improvement will probably come only after a further use of this technology to understand and manipulate the regulation of antibiotic biosynthesis as a facet of the general challenge of understanding differential gene expression. Streptomyces offers a particularly fertile field for such research, following the isolation of DNA segments that carry groups of closely linked operons for the biosynthesis of and resistance to particular antibiotics, and of genes with pleiotropic effects on morphological differentiation and *secondary* *metabolite* formation. (79 Refs.)

Descriptors: *Antibiotics--Biosynthesis--BI; *Genetic Engineering; Amino Acid Sequence; Molecular Sequence Data; Monensin--Biosynthesis--BI; Research Design

CAS Registry No.: 0 (Antibiotics); 17090-79-8 (Monensin)

6/9/4 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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12036919 BIOSIS NO.: 199900317438
Synthesis of dendryphiellin C, a trimeric sesquiterpene from a marine source.
AUTHOR: Akao Hiroko; Kiyota Hiromasa; Nakajima Takao; Kitahara Takeshi(a)
AUTHOR ADDRESS: (a)Department of Applied Biological Chemistry, Graduate School of Agricultural and Life Sciences, U**Japan
JOURNAL: Tetrahedron 55 (25):p7757-7770 June 18, 1999
ISSN: 0040-4020
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

ABSTRACT: Enantioselective synthesis of dendryphiellin C, isolated from cultures of Dendryphiella sarina, has been achieved in a convergent way such as coupling of a C9-branched carboxylic acid 10 with a trimeric-eremophilane alcohol 11. The latter was synthesized starting from a chiral building block, (1S,5S,6R)-5-hydroxybicyclo(4.1.0)heptan-2-one 16, which was originally prepared in this group using biochemical transformation as a key step. The synthesis was completed through 12 steps from 16 in overall 2.4% *yield*.

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Methods and Techniques

BIOSYSTEMATIC NAMES: *Fungi* Imperfecti or Deuteromycetes--*Fungi*, Plantae

ORGANISMS: Dendryphiella sarina (*Fungi* Imperfecti or Deuteromycetes)--marine *fungus*

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): *Fungi*; Microorganisms; Nonvascular Plants; Plants

CHEMICALS & BIOCHEMICALS: 1S,5S,6R)-5-hydroxybicyclo(4.1.0)heptan-2-one --chiral building block; dendryphiellin C--marine *secondary* *metabolite*, synthesis, trimeric-sesquiterpene

METHODS & EQUIPMENT: chemical synthesis protocol--synthetic method

CONCEPT CODES:

10050 Biochemical Methods-General
10506 Biophysics-Molecular Properties and Macromolecules
51522 Plant Physiology, Biochemistry and Biophysics-Chemical Constituents

BIOSYSTEMATIC CODES:

15500 *Fungi* Imperfecti or Deuteromycetes

6/9/5 (Item 2 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)
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11981585 BIOSIS NO.: 199900262104

The effect of head blight on reduction of *yield* traits and moniliformin accumulation in kernels of 17 winter wheat cultivars inoculated with *Fusarium avenaceum*.

AUTHOR: Kostecki Marian(a); Kaptur Przemyslaw; Wojciechowski Slawomir; Kaczmarek Zygmunt; Wisniewska Halina; Golinski Piotr

AUTHOR ADDRESS: (a)Katedra Chemii, Akademia Rolnicza im. Augusta Cieszkowskiego, Wojska Polskiego 75, 60-625, Pozna**Poland

JOURNAL: Plant Breeding and Seed Science 41 (1):p75-82 1997

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

SUMMARY LANGUAGE: English

ABSTRACT: The susceptibility to head blight of 17 winter wheat cultivars widely grown in Poland were tested in the field experiments (crops of 1994 and 1995). The effect of inoculation with *F. avenaceum* KF 203 (ATCC 64 451) isolate on the *yield* and on accumulation of moniliformin was examined. The average percentage of the kernels with visible symptoms of scab (crop 1995) was 39.2% while the average weight of kernels per head and weight of 1000 kernels were reduced to 92.5 and 80.5% of the control (non-inoculated), respectively. Moniliformin concentration in unselected sample of kernels amounted to 2.1 mg/kg. Basing on the number of diseased kernels, the extent of their contamination with the toxin and *yield* reduction it could be concluded that 3 cultivars, Liwilla, Caribo and Maltanka, are the least susceptible to *Fusarium* head blight, while Gama, Kobra and Almari are highly susceptible.

REGISTRY NUMBERS: 31876-38-7Q: MONILIFORMIN; 52591-22-7Q: MONILIFORMIN;
71376-34-6Q: MONILIFORMIN

DESCRIPTORS:

MAJOR CONCEPTS: Agronomy (Agriculture); Infection

BIOSYSTEMATIC NAMES: *Fungi* Imperfecti or Deuteromycetes--*Fungi*,
Plantae; Gramineae--Monocotyledones, Angiospermae, Spermatophyta,
Plantae

ORGANISMS: winter wheat (Gramineae)--host; *Fusarium avenaceum* (*Fungi*
Imperfecti or Deuteromycetes)--plant pathogen

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): Angiosperms; *Fungi*;
Microorganisms; Monocots; Nonvascular Plants; Plants; Spermatophytes;
Vascular Plants

DISEASES: *Fusarium* head blight--*fungal* disease

CHEMICALS & BIOCHEMICALS: moniliformin--accumulation, toxic *secondary*
metabolite

GEOGRAPHICAL NAME: Poland (Europe, Palearctic region)

MISCELLANEOUS TERMS: plant breeding

CONCEPT CODES:

54514 Phytopathology-Parasitism and Resistance

03504 Genetics and Cytogenetics-Plant

52504 Agronomy-Grain Crops

54502 Phytopathology-Diseases Caused by Fungi

BIOSYSTEMATIC CODES:

15500 *Fungi* Imperfecti or Deuteromycetes

25305 Gramineae

6/9/6 (Item 3 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)
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11456260 BIOSIS NO.: 199800237592

Solid state fermentation: Definition, characteristics, limitations and monitoring.

BOOK TITLE: Advances in solid state fermentation

AUTHOR: Viniegra-Gonzalez G(a)

BOOK AUTHOR/EDITOR: Roussos S; Lonsane B K; Raimbault M; Viniegra-Gonzales G; Eds

AUTHOR ADDRESS: (a)Dep. Biotechnology, Univ. Autonoma Metropolitana, Iztapalapa, Apartado Postal 55-535, 09340 Mexi**Mexico

p5-22 1997

BOOK PUBLISHER: Kluwer Academic Publishers, PO Box 989, 3300 AZ Dordrecht,
Netherlands

Kluwer Academic Publishers, 101 Phillip Drive, Norwell,
Massachusetts 02061, USA

CONFERENCE/MEETING: 2nd International Symposium on Solid State Fermentation
FMS-95 Montpellier, France February 27-28, 1997

ISBN: 0-7923-4732-3

RECORD TYPE: Citation

LANGUAGE: English

SUMMARY LANGUAGE: English; French

DESCRIPTORS:

MAJOR CONCEPTS: Bioprocess Engineering

BIOSYSTEMATIC NAMES: *Fungi*--Plantae

ORGANISMS: *fungi* (*Fungi*)

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): *Fungi*; Microorganisms;
Nonvascular Plants; Plants

METHODS & EQUIPMENT: solid state fermentation--advantages, limitations,
microbiological method

MISCELLANEOUS TERMS: enzyme production; microscopic heterogeneity;
product *yield*; *secondary* *metabolite* production; sporulation;
waste water reduction; Book Chapter; Meeting Paper

CONCEPT CODES:

39007 Food and Industrial Microbiology-Biosynthesis, Bioassay and
Fermentation

32000 Microbiological Apparatus, Methods and Media

51512 Plant Physiology, Biochemistry and Biophysics-Reproduction

51518 Plant Physiology, Biochemistry and Biophysics-Enzymes

51519 Plant Physiology, Biochemistry and Biophysics-Metabolism

00520 General Biology-Symposia, Transactions and Proceedings of
Conferences, Congresses, Review Annuals

BIOSYSTEMATIC CODES:

15000 *Fungi*-Unspecified

6/9/7 (Item 4 from file: 5)

DIALOG(R)File 5: Biosis Previews(R)

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10807954 BIOSIS NO.: 199799429099

BAS 494 02 F, a new broad-spectrum *fungicide* for disease control in
cereals.

AUTHOR: De Vleeschauwer J; Schelberger K; Saur R; Defloor K

AUTHOR ADDRESS: BASF Belgium, Brussels**Belgium

JOURNAL: Mededelingen Faculteit Landbouwkundige en Toegepaste Biologische
Wetenschappen Universiteit Gent 61 (2A):p367-376 1996

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: BAS 494 02 F is a new broad spectrum *fungicide* which contains 2
active ingredients: kresoxim-methyl and epoxiconazole. Kresoxim-methyl is
a new compound which has been developed starting from a *fungal*
secondary *metabolite*. Kresoxim-methyl is mainly effective on the leaf
surface. The second active ingredient epoxiconazole is a triazole which
has a systemic activity. The combination of both active ingredients
results in a product with a very high efficacy against all major cereal
diseases. Cereals treated with BAS 494 02 F are more healthy and show in
addition a greener appearance. The high degree of disease activity
combined with the green effect guarantee a considerable *yield* gain.

REGISTRY NUMBERS: 133855-98-8: EPOXICONAZOLE

DESCRIPTORS:

MAJOR CONCEPTS: Agronomy (Agriculture); Biochemistry and Molecular
Biophysics; Development; Infection; Pest Assessment Control and
Management

BIOSYSTEMATIC NAMES: Angiospermae--Angiospermae, Spermatophyta, Plantae

ORGANISMS: cereals (Angiospermae)

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): angiosperms; plants;
spermatophytes; vascular plants

CHEMICALS & BIOCHEMICALS: EPOXICONAZOLE

MISCELLANEOUS TERMS: Research Article; ACTIVE INGREDIENT; AGRONOMY; BAS
494 02 F; CROP COLOR; DISEASE CONTROL; EPOXICONAZOLE; *FUNGAL* DISEASE;

FUNGAL INFECTION; *FUNGAL* *SECONDARY* *METABOLITE*-DERIVED; GREEN;
HOST; INFECTION; KRESOXIM-METHYL; NEW BROAD-SPECTRUM *FUNGICIDE*; NEW
COMPOUND; PEST MANAGEMENT; PESTICIDES; *YIELD* GAIN

CONCEPT CODES:

10060 Biochemical Studies-General
51510 Plant Physiology, Biochemistry and Biophysics-Growth,
Differentiation
52504 Agronomy-Grain Crops
54502 Phytopathology-Diseases Caused by Fungi
54516 Phytopathology-Disease Control
54600 Pest Control, General; Pesticides; Herbicides

BIOSYSTEMATIC CODES:

25200 Angiospermae

6/9/8 (Item 5 from file: 5)
DIALOG(R)File 5: Biosis Previews(R)
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10144440 BIOSIS NO.: 199698599358

Development of in vitro identification techniques for special pathogenic
forms of *Fusarium oxysporum*.

AUTHOR: Rutherford M A; Bridge P D; Paterson R R M; Brayford D; Thomas V
AUTHOR ADDRESS: International Mycological Inst., Bakeham Lane, Egham TW20
9TY**UK

JOURNAL: Bulletin OEPP 25 (1-2):p137-142 1995

ISSN: 0250-8052

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

SUMMARY LANGUAGE: English; French; Russian

ABSTRACT: *Fungal* wilt diseases of plants caused by *Fusarium* spp. are of
major economic importance in a wide range of tropical crops, including
banana, cotton, tomato, oil palm, date palm and melon. Unfortunately
disease control is hampered by both difficult diagnosis and pathogen
variability. Our project is elucidating rapid laboratory techniques,
suitable for use in developing countries, which will differentiate
saprobic and parasitic forms of the *fungus* and identify particular
special forms. *Fusarium* isolates pathogenic to cotton, banana and tomato
and a range of saprobic forms have been screened by physiological testing
and thin layer chromatography for detection of secondary metabolites and
isozyme electrophoresis. Molecular systematic analyses of chromosomal and
mitochondrial DNA have also been investigated. Results show that an
integrated approach, involving application of more than one of the
techniques developed, is most useful for the differentiation of strains
belonging to specific pathogenic groups, such as special forms or races.
The techniques being developed will benefit disease diagnosis, research
into mechanisms of plant resistance and development of resistant
cultivars, epidemiological studies and soil-based control measures,
resulting in overall reductions in *yield* loss in countries where
fusarium wilt diseases are problematic.

DESCRIPTORS:

MAJOR CONCEPTS: Agronomy (Agriculture); Enzymology (Biochemistry and
Molecular Biophysics); Horticulture (Agriculture); Infection;
Metabolism; Pest Assessment Control and Management

BIOSYSTEMATIC NAMES: Cucurbitaceae--Dicotyledones, Angiospermae,
Spermatophyta, Plantae; *Fungi* Imperfecti or Deuteromycetes--*Fungi*,
Plantae; Malvaceae--Dicotyledones, Angiospermae, Spermatophyta, Plantae
; Musaceae--Monocotyledones, Angiospermae, Spermatophyta, Plantae;
Palmae--Monocotyledones, Angiospermae, Spermatophyta, Plantae;
Solanaceae--Dicotyledones, Angiospermae, Spermatophyta, Plantae

ORGANISMS: banana (Musaceae); cotton (Malvaceae); date palm (Palmae);
melon (Cucurbitaceae); oil palm (Palmae); tomato (Solanaceae); *Fusarium*
oxysporum (*Fungi* Imperfecti or Deuteromycetes); *Fusarium* spp. (
Fungi Imperfecti or Deuteromycetes)

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): angiosperms; dicots; *fungi*;
microorganisms; monocots; nonvascular plants; plants; spermatophytes;
vascular plants

MISCELLANEOUS TERMS: DISEASE CONTROL; DNA; ISOZYME; *SECONDARY*

METABOLITE

CONCEPT CODES:

10806 Enzymes-Chemical and Physical
13002 Metabolism-General Metabolism; Metabolic Pathways
51518 Plant Physiology, Biochemistry and Biophysics-Enzymes
51519 Plant Physiology, Biochemistry and Biophysics-Metabolism
52508 Agronomy-Fiber Crops
52514 Agronomy-Oil Crops
53004 Horticulture-Tropical and Subtropical Fruits and Nuts; Plantation
Crops
53008 Horticulture-Vegetables
54502 Phytopathology-Diseases Caused by Fungi
54516 Phytopathology-Disease Control
54600 Pest Control, General; Pesticides; Herbicides
10062 Biochemical Studies-Nucleic Acids, Purines and Pyrimidines
10064 Biochemical Studies-Proteins, Peptides and Amino Acids

BIOSYSTEMATIC CODES:

15500 *Fungi* Imperfecti or Deuteromycetes
25365 Musaceae
25380 Palmae
25890 Cucurbitaceae
26330 Malvaceae
26775 Solanaceae

6/9/9 (Item 6 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10091719 BIOSIS NO.: 199598546637

Liquid-culture pH, temperature, and carbon (not nitrogen) source regulate phenazine productivity of the take-all biocontrol agent *Pseudomonas fluorescens* 2-79.

AUTHOR: Slininger P J(a); Shea-Wilbur M A

AUTHOR ADDRESS: (a)Fermentation Biochem. Res. Unit, Natl. Cent. Agric. Utilization Res., USDA, Agric. Res. Serv., 1**USA

JOURNAL: Applied Microbiology and Biotechnology 43 (5):p794-800 1995

ISSN: 0175-7598

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: Strain 2-79 is a biocontrol agent against take-all, an important disease of wheat caused by *Gaeumannomyces graminis* var. *tritici*. In the rhizosphere, it produces the antibiotic phenazine 1-carboxylic acid (PCA) as the primary means of disease suppression. One barrier to commercial use of phenazine-producing pseudomonads, like strain 2-79, is the lack of liquid-culture technology for mass production. For instance, there is little published research concerning the impact of liquid-culture secondary metabolism on the biocontrol qualities of the cell harvest, i.e., efficacy, phytotoxicity, and storage survival. Yet it is important to know whether the fermentation process should be designed to enhance or eliminate *secondary* *metabolite* accumulation. To enable future exploration of this issue, we identified liquid-culture parameters that could be manipulated to control the phenazine productivity of strain 2-79. Our results indicated that PCA accumulation was very sensitive to the culture pH and temperature. It was possible to produce large cell populations with either high or low phenazine productivity by choosing to control culture pH at 7 and 8 respectively. Although high cell accumulations were achieved over the broad 25-34 degree C range studied, high, moderate, or low PCA productivities were observed at 25-27 degree C, 29-32.5 degree C, or 34 degree C respectively. When pH was controlled at 7, specific PCA productions at 25 degree C could be modulated by the choice of carbon source supplied. PCA accumulation per unit biomass reached 0.31 g/g on glucose, 0.16 g/g on glycerol and xylose, and only 0.09 g/g on fructose. Although the nitrogen source was also tested as a variable, it had little influence on culture PCA productivity under controlled pH.

REGISTRY NUMBERS: 7440-44-0: CARBON; 7727-37-9: NITROGEN; 92-82-0:
PHENAZINE

DESCRIPTORS:

MAJOR CONCEPTS: Agronomy (Agriculture); Biochemistry and Molecular Biophysics; Cell Biology; Infection; Metabolism; Methods and Techniques ; Nutrition; Pest Assessment Control and Management; Pharmacology; Physiology; Toxicology
 BIOSYSTEMATIC NAMES: Ascomycetes--*Fungi*, Plantae; Bacteria-General Unspecified--Eubacteria, Bacteria; *Fungi*-Unspecified--*Fungi*, Plantae; Pseudomonadaceae--Eubacteria, Bacteria
 ORGANISMS: bacteria (Bacteria - General Unspecified); *fungus* (*Fungi* - Unspecified); microorganism (Microorganisms - Unspecified); Gaeumannomyces graminis var. tritici (Ascomycetes); Pseudomonas fluorescens (Pseudomonadaceae)
 BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): bacteria; eubacteria; *fungi*; microorganisms; nonvascular plants; plants
 CHEMICALS & BIOCHEMICALS: CARBON; NITROGEN; PHENAZINE
 MISCELLANEOUS TERMS: ANTIBIOTICS; BIOTECHNOLOGY; CARBON SOURCES; DISEASE SUPPRESSION; EFFICACY; FERMENTATION; METHODS; PHYTOTOXICITY; SECONDARY METABOLISM; STORAGE SURVIVAL; TEMPERATURE; *YIELD*

CONCEPT CODES:

10010 Comparative Biochemistry, General
 10050 Biochemical Methods-General
 10060 Biochemical Studies-General
 10504 Biophysics-General Biophysical Techniques
 10506 Biophysics-Molecular Properties and Macromolecules
 10614 External Effects-Temperature as a Primary Variable (1971-)
 13002 Metabolism-General Metabolism; Metabolic Pathways
 13003 Metabolism-Energy and Respiratory Metabolism
 13004 Metabolism-Carbohydrates
 13202 Nutrition-General Studies, Nutritional Status and Methods
 13220 Nutrition-Carbohydrates (1972-)
 22002 Pharmacology-General
 22003 Pharmacology-Drug Metabolism; Metabolic Stimulators
 22501 Toxicology-General; Methods and Experimental
 30500 Morphology and Cytology of Bacteria
 31000 Physiology and Biochemistry of Bacteria
 32000 Microbiological Apparatus, Methods and Media
 38502 Chemotherapy-General; Methods; Metabolism
 39004 Food and Industrial Microbiology-Antibiotics, Biologics, Other Agents
 52504 Agronomy-Grain Crops
 54502 Phytopathology-Diseases Caused by Fungi
 54516 Phytopathology-Disease Control
 54600 Pest Control, General; Pesticides; Herbicides

BIOSYSTEMATIC CODES:

06508 Pseudomonadaceae (1992-)
 15100 Ascomycetes

6/9/10 (Item 7 from file: 5)
 DIALOG(R)File 5:Biosis Previews(R)
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09919840 BIOSIS NO.: 199598374758

Extractive fermentation of gibberellic acid by *Gibberella fujikuroi*.

AUTHOR: Hollmann Dirk; Switalski Joern; Geipel Sven; Onken Ulfert(a)

AUTHOR ADDRESS: (a)Lehrstuhl Technische Chemie B, Fachbereich

Chemietechnik, Univ. Dortmund, D-44221 Dortmund**Germany

JOURNAL: Journal of Fermentation and Bioengineering 79 (6):p594-600 1995

ISSN: 0922-338X

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: Microbial production of metabolites is often limited by product inhibition, decomposition or bio-degradation during the process of fermentation. If the product can be removed from the broth, e.g., by liquid/liquid extraction, these losses can be reduced. The production of gibberellic acid (GA-3), a *secondary* *metabolite* of the ascomycete *Gibberella fujikuroi*, was studied with respect to product inhibition and kinetics of decomposition under fermentation conditions. A two-fold increase in the *yield* of GA-3 as a result of on-line extraction of the

product by polyalkoxylate (Genapol 2822) is described. For this extractive fermentation, a stirred tank fermentor was used. The biomass was separated by cross-flow filtration and recycled. The filtrate was extracted in a mixer/settler unit with the extraction solvent. The raffinate was recycled to the fermentor. The influences of product inhibition, chemical decomposition of the product and possible biodegradation on the product *yield* are discussed.

REGISTRY NUMBERS: 77-06-5: GIBBERELIC ACID

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Bioprocess Engineering; Methods and Techniques; Pharmacognosy (Pharmacology); Pharmacology

BIOSYSTEMATIC NAMES: Ascomycetes--*Fungi*, Plantae; *Fungi*-Unspecified--*Fungi*, Plantae

ORGANISMS: *fungus* (*Fungi* - Unspecified); Gibberella fujikuroi (Ascomycetes)

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): *fungi*; microorganisms; nonvascular plants; plants

CHEMICALS & BIOCHEMICALS: GIBBERELIC ACID

INDUSTRY: biotechnology industry

MISCELLANEOUS TERMS: PHARMACEUTICALS; PROCESSING

CONCEPT CODES:

10050 Biochemical Methods-General
10504 Biophysics-General Biophysical Techniques
10506 Biophysics-Molecular Properties and Macromolecules
22002 Pharmacology-General
39007 Food and Industrial Microbiology-Biosynthesis, Bioassay and Fermentation
51522 Plant Physiology, Biochemistry and Biophysics-Chemical Constituents
54000 Pharmacognosy and Pharmaceutical Botany
10060 Biochemical Studies-General
10064 Biochemical Studies-Proteins, Peptides and Amino Acids

BIOSYSTEMATIC CODES:

15100 Ascomycetes

6/9/11 (Item 8 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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09593067 BIOSIS NO.: 199598047985

Production of benzaldehyde and benzyl alcohol by the mushroom Polyporus tuberaster K2606.

AUTHOR: Kawabe Tatsuya; Morita Hideo

AUTHOR ADDRESS: Food Res. Lab., Takara Shuzo Co. Ltd., Seta 3-4-1, Otsu, Shiga 520-21**Japan

JOURNAL: Journal of Agricultural and Food Chemistry 42 (11):p2556-2560 1994

ISSN: 0021-8561

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: The culture conditions of Polyporus tuberaster K2606 were investigated to find conditions with which much benzaldehyde and benzyl alcohol would be obtained. Strain K2606 reduced benzoic acid as well as L-phenylalanine to benzaldehyde and benzyl alcohol in high *yield*. The conversion rate of benzoic acid was about 60%. Two other metabolites of L-phenylalanine, 3-phenylpropionic acid and 3-phenylpyruvic acid, were reduced to benzaldehyde and benzyl alcohol as well. Veratryl alcohol, a *secondary* *metabolite* of L-phenylalanine, was not detected. Benzaldehyde produced by strain K2606 was reduced to benzyl alcohol, which was slowly converted again into benzaldehyde when culture with shaking continued. The maximum concentrations of benzaldehyde and benzyl alcohol produced by strain K2606 were 7.89 and 11.93 mM when L-phenylalanine was added to the culture medium at concentrations of 90 and 45 mM, respectively.

REGISTRY NUMBERS: 100-52-7: BENZALDEHYDE; 100-51-6: BENZYL ALCOHOL

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Foods; Metabolism; Methods and Techniques; Sense Organs (Sensory Reception)
 BIOSYSTEMATIC NAMES: Angiospermae--Angiospermae, Spermatophyta, Plantae; *Fungi*-Unspecified--*Fungi*, Plantae
 ORGANISMS: *fungus* (*Fungi* - Unspecified); vegetable (Angiospermae); Basidiomycetes (*Fungi* - Unspecified); Polysporus tuberaster (Organisms - Unspecified)
 BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): angiosperms; *fungi*; microorganisms; nonvascular plants; plants; spermatophytes; vascular plants
 CHEMICALS & BIOCHEMICALS: BENZALDEHYDE; BENZYL ALCOHOL
 MISCELLANEOUS TERMS: CONVERSION RATE; FLAVOR COMPOUNDS; FOOD PRODUCTS; FOOD RESIDUE; METABOLITES; METHODS; *YIELD*

CONCEPT CODES:

10010 Comparative Biochemistry, General
 10050 Biochemical Methods-General
 10054 Biochemical Methods-Proteins, Peptides and Amino Acids
 10060 Biochemical Studies-General
 10064 Biochemical Studies-Proteins, Peptides and Amino Acids
 10504 Biophysics-General Biophysical Techniques
 10506 Biophysics-Molecular Properties and Macromolecules
 13002 Metabolism-General Metabolism; Metabolic Pathways
 13012 Metabolism-Proteins, Peptides and Amino Acids
 13504 Food Technology-Fruits, Nuts and Vegetables
 13530 Food Technology-Evaluations of Physical and Chemical Properties (1970-)
 13532 Food Technology-Preparation, Processing and Storage (1970-)
 20004 Sense Organs, Associated Structures and Functions-Physiology and Biochemistry
 51519 Plant Physiology, Biochemistry and Biophysics-Metabolism
 51522 Plant Physiology, Biochemistry and Biophysics-Chemical Constituents
 51524 Plant Physiology, Biochemistry and Biophysics-Apparatus and Methods

BIOSYSTEMATIC CODES:

15300 Basidiomycetes

6/9/12 (Item 9 from file: 5)
 DIALOG(R)File 5:Biosis Previews(R)
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08977368 BIOSIS NO.: 199396128869

Improvement of shikonin productivity in Lithospermum erythrorhizon cell culture by alternating carbon and nitrogen feeding strategy.

AUTHOR: Srinivasan Venkatesh; Ryu Dewey D Y(a)

AUTHOR ADDRESS: (a)Dep. Chem. Eng., Univ. Calif., Davis, CA 95616**USA

JOURNAL: Biotechnology and Bioengineering 42 (7):p793-799 1993

ISSN: 0006-3592

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: Stationary phase cell suspension cultures of Agrobacterium tumefaciens transformed Lithospermum erythrorhizon respond to additions of sucrose-rich (C-rich) medium with a 2-3-fold increase in the accumulation of shikonin derivatives and a 3-3.5-fold increase in the accumulation of soluble phenolics while showing a modest (10-30%) increase in cell concentration. Conversely, the addition of nitrate-rich (N-rich) medium resulted in 25-35% increase in biomass concentration but only 2-9% increase in shikonin production and approx 3% increase in the *yield* of soluble phenolics. Repeated additions of C-rich medium resulted in only a modest (less than 10%) improvement in shikonin production over the levels obtained after the first application. No obvious correlation could be discerned between intracellular ATP levels or protein synthesis patterns and the pattern of shikonin accumulation following the addition of C-rich medium, suggesting that the precursor diversion mechanism is not generally applicable in our cell line. It was found that alternating feeding of N-rich and C-rich media could be used as an effective strategy for enhancing the productivity of plant

secondary *metabolite*.

REGISTRY NUMBERS: 517-89-5: SHIKONIN; 7440-44-0: CARBON; 7727-37-9:
NITROGEN; 56-65-5Q: ATP; 87805-51-4Q: ATP; 94587-45-8Q: ATP;
111839-44-2Q: ATP

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Cell Biology;
Development; Metabolism; Methods and Techniques; Nutrition; Physiology

BIOSYSTEMATIC NAMES: Boraginaceae--Dicotyledones, Angiospermae,
Spermatophyta, Plantae; *Fungi* Imperfecti or Deuteromycetes--*Fungi*,
Plantae

ORGANISMS: Boraginaceae (Boraginaceae); Cladosporium cladosporioides (
Fungi Imperfecti or Deuteromycetes)

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): angiosperms; dicots; *fungi*;
microorganisms; nonvascular plants; plants; spermatophytes; vascular
plants

CHEMICALS & BIOCHEMICALS: SHIKONIN; CARBON; NITROGEN; ATP

MISCELLANEOUS TERMS: ISOCOUMARIN; NOVEL CHEMICAL STRUCTURE

CONCEPT CODES:

02504 Cytology and Cytochemistry-Plant
10060 Biochemical Studies-General
13002 Metabolism-General Metabolism; Metabolic Pathways
32500 Tissue Culture, Apparatus, Methods and Media
51504 Plant Physiology, Biochemistry and Biophysics-Nutrition
51510 Plant Physiology, Biochemistry and Biophysics-Growth,
Differentiation
51519 Plant Physiology, Biochemistry and Biophysics-Metabolism
51522 Plant Physiology, Biochemistry and Biophysics-Chemical
Constituents
51526 Plant Physiology, Biochemistry and Biophysics-General and
Miscellaneous
01004 Methods, Materials and Apparatus, General-Laboratory Methods
04500 Mathematical Biology and Statistical Methods
10010 Comparative Biochemistry, General
10050 Biochemical Methods-General
10062 Biochemical Studies-Nucleic Acids, Purines and Pyrimidines
10069 Biochemical Studies-Minerals
10506 Biophysics-Molecular Properties and Macromolecules
13003 Metabolism-Energy and Respiratory Metabolism
13014 Metabolism-Nucleic Acids, Purines and Pyrimidines
13202 Nutrition-General Studies, Nutritional Status and Methods
51524 Plant Physiology, Biochemistry and Biophysics-Apparatus and
Methods
52000 Economic Botany, General

BIOSYSTEMATIC CODES:

25665 Boraginaceae

6/9/13 (Item 10 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)

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08818071 BIOSIS NO.: 199395107422

Dynamic response of immobilized cells to pulse addition of L-valine in
cyclosporin A biosynthesis.

AUTHOR: Chun G-T; Agathos S N(a)

AUTHOR ADDRESS: (a)Dep. Chemical Biochem. Engineering, Rutgers University,
PO Box 909, Piscataway, NJ 08855-0909**USA

JOURNAL: Journal of Biotechnology 27 (3):p283-294 1993

ISSN: 0168-1656

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: A feeding strategy for L-valine was tested in the production of
cyclosporin A (CyA), a powerful immunosuppressive *secondary*
metabolite, in celite-immobilized cells of the *fungus* Tolypocladium
inflatum. This system has been previously shown to have promise over
conventional submerged systems. Significant increase in Cy A biosynthesis
was manifested in the immobilized cells when L-valine was added at 108 h
(system C) and at 156 h (system D) during the exponential growth phase.

However, no clearly stimulating effect of L-valine on Cy A titre was observed when the amino acid was supplemented at hour 60 (lag phase, system B) or when the valine was present from the start (system A), where system A = 100%, system B = 113%, system C = 253%, system D = 302%. The large contribution enhanced production of Cy A in systems C and D may be explained the preferential channeling of L-valine to growth during the lagphase and to secondary metabolism during the late exponential phase of the immobilized cells.

REGISTRY NUMBERS: 72-18-4: L-VALINE; 59865-13-3: CYCLOSPORIN A

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Cell Biology; Development; General Life Studies; Metabolism; Methods and Techniques; Pharmacology; Physiology
BIOSYSTEMATIC NAMES: *Fungi*-Unspecified--*Fungi*, Plantae; *Fungi* Imperfecti or Deuteromycetes--*Fungi*, Plantae
ORGANISMS: *fungus* (*Fungi* - Unspecified); *Tolypocladium inflatum* (*Fungi* Imperfecti or Deuteromycetes)
BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): *fungi*; microorganisms; nonvascular plants; plants
CHEMICALS & BIOCHEMICALS: L-VALINE; CYCLOSPORIN A
INDUSTRY: biotechnology industry
MISCELLANEOUS TERMS: FEEDING STRATEGY; GROWTH PHASE; IMMUNOSUPPRESSANT-DRUG; METHODS; PHARMACEUTICALS; SECONDARY METABOLITES; *YIELD*

CONCEPT CODES:

02504 Cytology and Cytochemistry-Plant
10064 Biochemical Studies-Proteins, Peptides and Amino Acids
10511 Biophysics-Bioengineering
13012 Metabolism-Proteins, Peptides and Amino Acids
22003 Pharmacology-Drug Metabolism; Metabolic Stimulators
22018 Pharmacology-Immunological Processes and Allergy
32000 Microbiological Apparatus, Methods and Media
39004 Food and Industrial Microbiology-Antibiotics, Biologics, Other Agents
51510 Plant Physiology, Biochemistry and Biophysics-Growth, Differentiation
51519 Plant Physiology, Biochemistry and Biophysics-Metabolism
51526 Plant Physiology, Biochemistry and Biophysics-General and Miscellaneous
04500 Mathematical Biology and Statistical Methods
10050 Biochemical Methods-General
10054 Biochemical Methods-Proteins, Peptides and Amino Acids
10060 Biochemical Studies-General
10502 Biophysics-General Biophysical Studies
13002 Metabolism-General Metabolism; Metabolic Pathways
13224 Nutrition-Proteins, Peptides and Amino Acids (1972-)
34508 Immunology and Immunochimistry-Immunopathology, Tissue Immunology
51504 Plant Physiology, Biochemistry and Biophysics-Nutrition
51524 Plant Physiology, Biochemistry and Biophysics-Apparatus and Methods

BIOSYSTEMATIC CODES:

15500 *Fungi* Imperfecti or Deuteromycetes

6/9/14 (Item 11 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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08093879 BIOSIS NO.: 000093103952
INDOLE-3-ETHANOL PRODUCED BY *ZYGORRHYNCHUS-MOELLERI* AN INDOLE-3-ACETIC ACID ANALOGUE WITH ANTIFUNGAL ACTIVITY
AUTHOR: BROWN A E; HAMILTON J T G
AUTHOR ADDRESS: PLANT PATHOLOGY RES. DIV., DEP. AGRICULTURE NORTHERN IRELAND, NEWFORGE LANE, BELFAST BT9 5PX, UK.
JOURNAL: MYCOL RES 96 (1). 1992. 71-74. 1992
FULL JOURNAL NAME: Mycological Research
CODEN: MYCRE
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Indole-3-ethanol (IEt) was identified as a major *secondary* *metabolite* in cultures of *Z. moelleri* containing casein hydrolysate as the nitrogen source. Much smaller quantities of indole-3-acetic acid (IAA) were produced. In a medium containing an inorganic nitrogen source *Z. moelleri* metabolized tryptophan to IEt and IAA. The highest *yield* of IAA was produced at pH 4.5 while that of IEt was maximal in less acidic conditions. Tryptamine was also metabolised to IEt. When supplied with exogenous IEt *Z. moelleri* did not produce IAA, and IEt oxidase was not detected in either culture filtrate or *fungal* mycelium. IEt inhibited germination of zoospores of *Phytophthora cinnamomi*, oögonia of two *Pythium* spp. and conidia of *Fusarium oxysporum* f. sp. lini with ED50 values between 1.8 and 12.7 µg ml⁻¹. Mycelial growth of these *fungi* and *Rhizotonia solani* and *Sclerotinia sclerotiorum* was also suppressed by IEt.

DESCRIPTORS: PHYTOPHTHORA-CINNAMOMI PYTHIUM-SPP FUSARIUM-OXYSPORUM RHIZOCTONIA-SOLANI SCLEROTINIA-SCLEROTIURUM IAA BIOLOGICAL CONTROL

CONCEPT CODES:

51510 Plant Physiology, Biochemistry and Biophysics-Growth, Differentiation
51514 Plant Physiology, Biochemistry and Biophysics-Growth Substances
54502 Phytopathology-Diseases Caused by Fungi
54516 Phytopathology-Disease Control

BIOSYSTEMATIC CODES:

15100 Ascomycetes
15500 *Fungi* Imperfecti or Deuteromycetes
15900 Phycomycetes

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Microorganisms
Plants
Nonvascular Plants
Fungi

6/9/15 (Item 12 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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07055303 BIOSIS NO.: 000089125406

COMPARISON OF THE PERFORMANCES OF STIRRED TANK AND AIRLIFT TOWER LOOP REACTORS

AUTHOR: SCHUEGERL K

AUTHOR ADDRESS: INST. FUER TECHNISCHE CHEMIE, UNIV. HANNOVER, CALLINSTR. 3, D-3000 HANNOVER, FRG.

JOURNAL: J BIOTECHNOL 13 (4). 1990. 251-256. 1990

FULL JOURNAL NAME: Journal of Biotechnology

CODEN: JBITD

RECORD TYPE: Abstract

LANGUAGE: ENGLISH

ABSTRACT: Following a consideration of the prerequisites for reactor comparison and the fundamental differences between stirred tank and airlift tower loop reactors, their performances are compared for the production of secondary metabolites: penicillin V by *Penicillium chrysogenum*, cephalosporin C by *Cephalosporium acremonium*, and tetracycline by *Streptomyces aureofaciens*. In stirred tank reactor, cell mass concentrations, volumetric productivities, and specific power inputs are higher than in airlift tower loop reactors. In the latter, efficiencies of oxygen transfer are higher, and specific productivities with regard to power input, substrate and oxygen consumptions, and *yield* coefficients of product formation with regard to substrate and oxygen consumptions are considerably higher than in stirred tank reactors. The prerequisites for improved performance are discussed.

DESCRIPTORS: PENICILLIUM-CHRYSOGENUM CEPHALOSPORIUM-ACREMONIUM STREPTOMYCES-AUREOFACIENS *FUNGUS* BACTERIA BIOTECHNOLOGY INDUSTRY FERMENTATION COMPARATIVE ANALYSIS *SECONDARY* *METABOLITE* PENICILLIN CEPHALOSPORIN TETRACYCLINE ANTIBIOTICS

CONCEPT CODES:

10060 Biochemical Studies-General
10504 Biophysics-General Biophysical Techniques

10511 Biophysics-Bioengineering
 13002 Metabolism-General Metabolism; Metabolic Pathways
 31000 Physiology and Biochemistry of Bacteria
 38502 Chemotherapy-General; Methods; Metabolism
 39004 Food and Industrial Microbiology-Antibiotics, Biologics, Other Agents
 51519 Plant Physiology, Biochemistry and Biophysics-Metabolism
 22002 Pharmacology-General
 29500 Microorganisms, General
 32000 Microbiological Apparatus, Methods and Media
 BIOSYSTEMATIC CODES:
 05828 Streptomycetaceae (1979-)
 15500 *Fungi* Imperfecti or Deuteromycetes
 BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):
 Microorganisms
 Bacteria
 Plants
 Nonvascular Plants
 Fungi

6/9/16 (Item 13 from file: 5)
 DIALOG(R)File 5:Biosis Previews(R)
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06709874 BIOSIS NO.: 000088019297
 THE EFFECT OF FEEDBACK REGULATION AND IN SITU PRODUCT REMOVAL ON THE
 CONVERSION OF SUGAR TO CYCLOHEXIMIDE BY STREPTOMYCES-GRISEUS
 AUTHOR: PAYNE G F; WANG H Y
 AUTHOR ADDRESS: DEP. OF CHEM. ENG., CENT. FOR AGRIC. BIOTECHNOL., UNIV. OF
 MD. BALTIMORE COUNTY, BALTIMORE, MD. 21228, USA.
 JOURNAL: ARCH MICROBIOL 151 (4). 1989. 331-335. 1989
 FULL JOURNAL NAME: Archives of Microbiology
 CODEN: AMICC
 RECORD TYPE: Abstract
 LANGUAGE: ENGLISH

ABSTRACT: An addition of cycloheximide to cycloheximide- producing
 Streptomyces griseus cultures resulted in reductions in the production
 rate and in the conversion of sugar into cycloheximide. In situ
 cycloheximide adsorption was observed to enhance: total cycloheximide
 titers; productivities; and the conversion of sugar to cycloheximide.
 During the *secondary* *metabolite*-producing phase, sugar consumption
 was observed to be linearly dependent on cycloheximide productivity. From
 this analysis a true product *yield* and maintenance coefficient were
 estimated to be 0.08 g cycloheximide/g glucose and 0.028 g glucose/g
 cell-h, respectively. The sixfold difference between this true product
 yield and a theoretical value obtained from knowledge of the
 biosynthetic pathway is discussed. Since the maintenance sugar
 requirement for cycloheximide production is large, stimulation of
 biosynthesis through in situ adsorption significantly increases the
 overall efficiency of sugar conversion to this *secondary* *metabolite*.

DESCRIPTORS: *FUNGICIDE* BIOTECHNOLOGY FERMENTATION
 CONCEPT CODES:

10050 Biochemical Methods-General
 13002 Metabolism-General Metabolism; Metabolic Pathways
 13004 Metabolism-Carbohydrates
 31000 Physiology and Biochemistry of Bacteria
 39007 Food and Industrial Microbiology-Biosynthesis, Bioassay and Fermentation
 10060 Biochemical Studies-General
 10068 Biochemical Studies-Carbohydrates
 32000 Microbiological Apparatus, Methods and Media
 BIOSYSTEMATIC CODES:
 05828 Streptomycetaceae (1979-)
 BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):
 Microorganisms
 Bacteria

6/9/17 (Item 14 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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06088450 BIOSIS NO.: 000085051599
SUBMERGED FERMENTATION OF PENICILLIUM-PAXILLI BIOSYNTHESIZING PAXILLINE A
PROCESS INHIBITED BY CALCIUM-INDUCED SPORULATION
AUTHOR: IBBA M; TAYLOR S J C; WEEDON C M; MANTLE P G
AUTHOR ADDRESS: DEP. BIOCHEM., IMPERIAL COLL., LONDON SW7 2AZ, UK.
JOURNAL: J GEN MICROBIOL 133 (11). 1987. 3109-3120. 1987
FULL JOURNAL NAME: Journal of General Microbiology
CODEN: JGMIA
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: A submerged fermentation process for the production of the tremorgenic mycotoxin paxilline by *Penicillium paxilli* has been developed. The *fungus* did not sporulate and accumulated paxilline to 1.5% (w/w) in freeze-dried cells within 6 d in a 60 l stirred fermenter. Induction of extensive differentiation of conidiophores and profuse sporulation by adding 2% (w/w) $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ to the medium at batching reduced paxilline *yield* by 97%. Paxilline biosynthesis occurred when the glucose in the medium had been exhausted, implying that carbon catabolite repression may be involved in the biosynthesis of this alkaloid, even when calcium-induced sporulation inhibits or delays the onset of paxilline biosynthesis. Sporulation-induced inhibition of indole-terpenoid alkaloid biosynthesis of *P. paxilli* contrasts with the situation in some other penicillia elaborating indole alkaloids and allows disassociation of aspects of *secondary* *metabolite* biosynthesis from growth-associated differentiation, which formerly seemed to be linked.

DESCRIPTORS: TREMORGENIC MYCOTOXIN CARBON CATABOLITE REPRESSION INDOLE
ALKALOID *SECONDARY* *METABOLITE*

CONCEPT CODES:

13002 Metabolism-General Metabolism; Metabolic Pathways
13004 Metabolism-Carbohydrates
22501 Toxicology-General; Methods and Experimental
51510 Plant Physiology, Biochemistry and Biophysics-Growth,
Differentiation
51512 Plant Physiology, Biochemistry and Biophysics-Reproduction
51519 Plant Physiology, Biochemistry and Biophysics-Metabolism
10010 Comparative Biochemistry, General
10069 Biochemical Studies-Minerals
13206 Nutrition-Minerals
17506 Muscle-Pathology
20506 Nervous System-Pathology
25508 Developmental Biology-Embryology-Morphogenesis, General
36008 Medical and Clinical Microbiology-Mycology
39004 Food and Industrial Microbiology-Antibiotics, Biologics, Other
Agents
51504 Plant Physiology, Biochemistry and Biophysics-Nutrition
51522 Plant Physiology, Biochemistry and Biophysics-Chemical
Constituents
51524 Plant Physiology, Biochemistry and Biophysics-Apparatus and
Methods

BIOSYSTEMATIC CODES:

15500 *Fungi* Imperfecti or Deuteromycetes

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Microorganisms
Plants
Nonvascular Plants
Fungi

6/9/18 (Item 15 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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05172267 BIOSIS NO.: 000082012888
MANGANESE AND ANTIBIOTIC BIOSYNTHESIS I. A SPECIFIC MANGANESE REQUIREMENT

FOR PATULIN PRODUCTION IN PENICILLIUM-URTICAE
AUTHOR: SCOTT R E; JONES A; LAM K S; GAUCHER G M
AUTHOR ADDRESS: SECTION OF CLINICAL CHEMISTRY, DEPARTMENT OF LABORATORY
MEDICINE, MAYO CLINIC, ROCHESTER, MINN, USA 55905.
JOURNAL: CAN J MICROBIOL 32 (3). 1986. 259-267. 1986
FULL JOURNAL NAME: Canadian Journal of Microbiology
CODEN: CJMIA
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: The effect of trace metal nutrition on the functioning of the patulin biosynthetic pathway in submerged cultures of *Penicillium urticae* (NRRL 2159A) was examined by both chromatographic and enzymological means. Comprehensive metal ion analysis showed generally low levels of contaminating metal ions in media components. Of eight metal ions examined, only manganese strongly influenced *secondary* *metabolite* production. In control cultures or cultures deficient in calcium, iron, cobalt, copper, zinc, or molybdenum, pathway metabolites appeared in the medium at about 25 h after inoculation. The first pathway-specific metabolite 6-methylsalicylic acid, accumulated only transiently before being converted to patulin whose concentration steadily increased. In manganese-deficient cultures, however, 6-methylsalicylic acid continued to accumulate, with only minor amounts of patulin being produced. Additionally, a marker enzyme for the pathway showed only 0-20% of control activity. Clear dose responses (patulin versus manganese) were found in different media, with no effect on growth *yield*. Addition of manganese to depleted cultures at 18, 26, or 36 h resulted in increasing marker enzyme activity and patulin concentrations. It is concluded that manganese exerts a specific, positive effect on patulin biosynthesis and may in some way control the section of the patulin pathway occurring after 6-methylsalicylic acid.

DESCRIPTORS: TRACE METAL NUTRITION ENZYMES CHROMATOGRAPHY PATHWAY
METABOLITES

CONCEPT CODES:

10060 Biochemical Studies-General
13002 Metabolism-General Metabolism; Metabolic Pathways
13206 Nutrition-Minerals
22003 Pharmacology-Drug Metabolism; Metabolic Stimulators
22501 Toxicology-General; Methods and Experimental
38502 Chemotherapy-General; Methods; Metabolism
39004 Food and Industrial Microbiology-Antibiotics, Biologics, Other Agents
51504 Plant Physiology, Biochemistry and Biophysics-Nutrition
51510 Plant Physiology, Biochemistry and Biophysics-Growth, Differentiation
51519 Plant Physiology, Biochemistry and Biophysics-Metabolism
51522 Plant Physiology, Biochemistry and Biophysics-Chemical Constituents
10010 Comparative Biochemistry, General
10064 Biochemical Studies-Proteins, Peptides and Amino Acids
10069 Biochemical Studies-Minerals
10504 Biophysics-General Biophysical Techniques
10506 Biophysics-Molecular Properties and Macromolecules
10804 Enzymes-Methods
10806 Enzymes-Chemical and Physical
10808 Enzymes-Physiological Studies
13010 Metabolism-Minerals
32000 Microbiological Apparatus, Methods and Media

BIOSYSTEMATIC CODES:

15500 *Fungi* Imperfecti or Deuteromycetes

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Microorganisms
Plants
Nonvascular Plants
Fungi

02107987 BIOSIS NO.: 000063022980
TOTAL SYNTHESIS OF VERRUCARIN E ITS APPLICATION TO THE PREPARATION OF A
CARBON-13 LABELED DERIVATIVE
AUTHOR: GOSSAUER A; SUHL K
JOURNAL: HELV CHIM ACTA 59 (5). 1976 1698-1704. 1976
FULL JOURNAL NAME: Helvetica Chimica Acta
CODEN: HCACA
RECORD TYPE: Abstract

ABSTRACT: A relatively high over-all *yield* synthesis of verrucarín E (3-acetyl-4-hydroxymethyl-pyrrole), a *secondary* *metabolite* of the soil *fungus* Myrothecium verrucaria, was achieved by condensation of (E)-5-benzyloxy-3-penten-2-one with tosylmethylisocyanide and subsequent hydrogenolysis of the obtained O-benzyl derivative. As the closure to the pyrrole ring takes place regiospecifically, this procedure is convenient for preparing verrucarín E labeled with C-isotopes. On the basis of the data obtained from the ¹³C-NMR spectrum of verrucarín E labeled with ¹³C at the C(2) and C(3) positions, all the ¹³C-resonances of verrucarín E were assigned unambiguously.

DESCRIPTORS: MYROTHECIUM-VERRUCARIA

CONCEPT CODES:

10060 Biochemical Studies-General
51522 Plant Physiology, Biochemistry and Biophysics-Chemical
Constituents
06504 Radiation-Radiation and Isotope Techniques
10050 Biochemical Methods-General
10506 Biophysics-Molecular Properties and Macromolecules
51516 Plant Physiology, Biochemistry and Biophysics-Light and Radiation
Effects
51524 Plant Physiology, Biochemistry and Biophysics-Apparatus and
Methods

BIOSYSTEMATIC CODES:

15500 *Fungi* Imperfecti or Deuteromycetes

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Microorganisms
Plants
Nonvascular Plants
Fungi

?

PLEASE ENTER A COMMAND OR BE LOGGED OFF IN 5 MINUTES

?s isopenicillin N and increase(w)production
23 ISOPENICILLIN N
1516937 INCREASE
945925 PRODUCTION
588 INCREASE(W)PRODUCTION
S7 0 ISOPENICILLIN N AND INCREASE(W)PRODUCTION
?s cpcr1
S8 4 CPCR1
?s ispenicillin N
S9 0 ISPENICILLIN N
?s isopenicillin N
S10 23 ISOPENICILLIN N
?s s10 and s8
23 S10
4 S8
S11 0 S10 AND S8
?s 10
S12 2451570 10
?s s10
S13 23 S10
?rd
...completed examining records
S14 23 RD (unique items)
?t/3/all

14/3/1 (Item 1 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE
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00133019 94129985
Acyl-coenzyme A:isopenicillin N acyltransferase from penicillium
chrysogenum: Effect of amino acid substitutions at Sersup 2sup 2sup 7,
Sersup 2sup 3sup 0 and Sersup 3sup 0sup 9 on proenzyme cleavage and
activity
Tobin M.B.; Cole S.C.J.; Kovacevic S.; Miller J.R.; Baldwin J.E.;
Sutherland J.D.
ADDRESS: M.B. Tobin, Dyson Perrins Laboratory, Oxford Centre for Molecular
Sciences, South Parks Road, Oxford OX1 3QY, United Kingdom
Journal: FEMS Microbiology Letters, 121/1 (39-46), 1994, Netherlands
PUBLICATION DATE: 19940000'
CODEN: FMLED
ISSN: 0378-1097
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English

14/3/2 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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12863703 BIOSIS NO.: 200100070852
Bioprocesses for preparing 7-ACA and 7-ADAC.
AUTHOR: Conder Michael J; Rambosek John A; McAda Phyllis C; Reeves
Christopher D
JOURNAL: Official Gazette of the United States Patent and Trademark Office
Patents 1235 (1):pNo Pagnation June 6, 2000
MEDIUM: e-file
ISSN: 0098-1133
DOCUMENT TYPE: Patent
RECORD TYPE: Abstract
LANGUAGE: English

14/3/3 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

12745832 BIOSIS NO.: 200000499455
Synthesis of penicillin N and isopenicillin N.
AUTHOR: Lau Rute Madeira; van Eupen Jacques T H; Schipper Dick; Tesser
Godefridus I; Verweij Jan; de Vroom Erik(a)
AUTHOR ADDRESS: (a)DSM Anti-Infectives, 2600 MA, Delft**Netherlands
JOURNAL: Tetrahedron 56 (38):p7601-7606 15 September, 2000
MEDIUM: print
ISSN: 0040-4020
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

14/3/4 (Item 3 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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12698648 BIOSIS NO.: 200000452150
Structure-function studies of the non-heme iron active site of
isopenicillin N synthase: 'Some implications for catalysis.
AUTHOR: Kreisberg-Zakarin Rachel; Borovok Ilya; Yanko Michaela; Frolow
Felix; Aharonowitz Yair; Cohen Gerald(a)
AUTHOR ADDRESS: (a)Department of Molecular Microbiology and Biotechnology,
George S. Wise Faculty of Life Sciences, Tel Aviv University, Ramat Aviv,
69978**Israel
JOURNAL: Biophysical Chemistry 86 (2-3):p109-118 30 August, 2000
MEDIUM: print
ISSN: 0301-4622
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

14/3/5 (Item 4 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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12512624 BIOSIS NO.: 200000266126
Mutational analysis of tyrosine-191 in the catalysis of Cephalosporium
acremonium isopenicillin N synthase.
AUTHOR: Loke Paxton; Sim Tiow-Suan(a)
AUTHOR ADDRESS: (a)Department of Microbiology, Faculty of Medicine,
National University of Singapore, 10 Kent Ridge Crescent, Singapore,
119260**Singapore
JOURNAL: Journal of Biochemistry (Tokyo) 127 (4):p585-589 April, 2000
MEDIUM: print.
ISSN: 0021-924X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

14/3/6 (Item 5 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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12248233 BIOSIS NO.: 200000001735
The reaction cycle of isopenicillin N synthase observed by X-ray
diffraction.
AUTHOR: Burzlaff Nicolai I; Rutledge Peter J; Clifton Ian J; Hensgens
Charles M H; Pickford Michael; Adlington Robert M; Roach Peter L; Baldwin
Jack E(a)
AUTHOR ADDRESS: (a)Dyson Perrins Laboratory and the Oxford Centre for
Molecular Sciences, University of Oxford, South Parks Road, Oxford, OX1
3QY**UK
JOURNAL: Nature (London) 401 (6754):p721-724 Oct. 14, 1999
ISSN: 0028-0836
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

14/3/7 (Item 6 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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11657441 BIOSIS NO.: 199800439172
Mutational evidence for the role of serine-283 in Cephalosporium acremonium
isopenicillin N synthase.
AUTHOR: Loke Paxton; Sim Tiow-Suan(a)
AUTHOR ADDRESS: (a)Dep. Microbiol., Fac. Med., Natl. Univ. Singapore, 10
Kent Ridge Crescent, Singapore 119260**Singapore
JOURNAL: FEMS Microbiology Letters 165 (2):p353-356 Aug. 15, 1998
ISSN: 0378-1097
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/8 (Item 7 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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11097477 BIOSIS NO.: 199799718622
Genetic engineering of penicillin biosynthesis.
AUTHOR: Shorrock Celia P(a); Sutherland J D
AUTHOR ADDRESS: (a)Dyson Perrins Lab., Oxford OX1 3QY**UK
JOURNAL: FASEB Journal 11 (9):pA884 1997
CONFERENCE/MEETING: 17th International Congress of Biochemistry and
Molecular Biology in conjunction with the Annual Meeting of the American

Society for Biochemistry and Molecular Biology San Francisco, California,
USA August 24-29, 1997
ISSN: 0892-6638
RECORD TYPE: Citation
LANGUAGE: English

14/3/9 (Item 8 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

10880671 BIOSIS NO.: 199799501816
Glutamine-330 is not essential for activity in isopenicillin N synthase
from *Aspergillus nidulans*.
AUTHOR: Sami Malkit; Brown Toby J N; Roach Peter L; Schofield Christosper J
; Baldwin Jack E(a)
AUTHOR ADDRESS: (a)Dyson Perrins Lab., Oxford Cent. Molecular Sci., South
Parks Road, Oxford OX1 3QY**UK
JOURNAL: FEBS Letters 405 (2):p191-194 1997
ISSN: 0014-5793
RECORD TYPE: Abstract
LANGUAGE: English

14/3/10 (Item 9 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10753103 BIOSIS NO.: 199799374248
Anaerobic crystallisation of an isopenicillin N synthase cntdot Fe(II)
cntdot substrate complex demonstrated by X-ray studies.
AUTHOR: Roach Peter L(a); Clifton Ian J; Hensgens Charles M H; Shibata
Norio; Long Alexandra J; Strange Richard W; Hasnain Samar S; Schofield
Christopher J; Baldwin Jack E; Hajdu Janos
AUTHOR ADDRESS: (a)Dyson Perrins Lab., South Park Rd., Oxford OX1 3QY**UK
JOURNAL: European Journal of Biochemistry 242 (3):p736-740 1996
ISSN: 0014-2956
RECORD TYPE: Abstract
LANGUAGE: English

14/3/11 (Item 10 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10386521 BIOSIS NO.: 199699007666
Characterization of a *Penicillium chrysogenum* gene encoding a PacC
transcription factor and its binding sites in the divergent pcbAB-pcbC
promoter of the penicillin biosynthetic cluster.
AUTHOR: Suarez Tresa; Angel Penalva Miguel(a)
AUTHOR ADDRESS: (a)Dep. Microbiol. Mol., Cent. Invest. Biol. CSIC,
Velazquez 144, Madrid 28006**Spain
JOURNAL: Molecular Microbiology 20 (3):p529-540 1996
ISSN: 0950-382X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/12 (Item 11 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

10335237 BIOSIS NO.: 199698790155
Purification and characterization of recombinant *Streptomyces clavuligerus*
isopenicillin N synthase produced in *Escherichia coli*.
AUTHOR: Durairaj M; Jensen S E(a)
AUTHOR ADDRESS: (a)Dep. Biol. Sci., Univ. Alberta, Edmonton, AB, T6G 2E9**
Canada
JOURNAL: Journal of Industrial Microbiology 16 (3):p197-203 1996
ISSN: 0169-4146

DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/13 (Item 12 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10278684 BIOSIS NO.: 199698733602
Ferrous active site of isopenicillin N synthase: Genetic and sequence analysis of the endogenous ligands.
AUTHOR: Borovok Ilya; Landman Orna; Kreisberg-Zakarin Rachel; Aharonowitz Yair; Cohen Gerald(a)
AUTHOR ADDRESS: (a)Dep. Mol. Microbiol. Biotechnol., George S. Wise Fac. Life Sci., Tel-Aviv Univ., Ramat Aviv 6997**Israel
JOURNAL: Biochemistry 35 (6):p1981-1987 1996
ISSN: 0006-2960
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/14 (Item 13 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10237006 BIOSIS NO.: 199698691924
Evidence for an insertion-homolysis mechanism for carbon-sulphur bond formation in penicillin biosynthesis; 2. Incubation and interpretation.
AUTHOR: Baldwin Jack E(a); Adlington Robert M; Marquess Daniel G; Pitt Andrew R; Porter Michael J; Russell Andrew T
AUTHOR ADDRESS: (a)Dyson Perrins Lab., Oxford Centre Molecular Sci., South Parks Road, Oxford OX1 3QY**UK
JOURNAL: Tetrahedron 52 (7):p2537-2556 1996
ISSN: 0040-4020
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/15 (Item 14 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10231183 BIOSIS NO.: 199698686101
Functional analysis of conserved histidine residues in Cephalosporium acremonium isopenicillin N synthase by site-directed mutagenesis.
AUTHOR: Tan Doreen S H; Sim Tiow-Suan(a)
AUTHOR ADDRESS: (a)Dep. Microbiol., Fac. Medicine, Natl. Univ. Singapore, Lower Kent Ridge Road, Singapore 0511**Singapore
JOURNAL: Journal of Biological Chemistry 271 (2):p889-894 1996
ISSN: 0021-9258
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/16 (Item 15 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10113327 BIOSIS NO.: 199698568245
Cleavage of the 5-amino-5-carboxy-2-oxapentanoyl side chain from enzymatically synthesised penicillins and cephalosporins.
AUTHOR: Baldwin Jack E(a); Davis S Christopher(a); Forrest Andrew K; Schofield Christopher J(a)
AUTHOR ADDRESS: (a)Dyson Perrins Lab., South Parks Road, Oxford OX1 3QY**UK
JOURNAL: Bioorganic & Medicinal Chemistry Letters 5 (21):p2507-2512 1995
ISSN: 0960-894X
DOCUMENT TYPE: Article

RECORD TYPE: Abstract
LANGUAGE: English

14/3/17 (Item 16 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10012434 BIOSIS NO.: 199598467352
Giant linear plasmids of beta-lactam antibiotic producing Streptomyces.
AUTHOR: Netolitzky Donald J; Wu Xiaoning; Jensen Susan E; Roy Kenneth L(a)
AUTHOR ADDRESS: (a)Dep. Biol. Sci., Univ. Alberta, Edmonton, AB T6G 2E9**
Canada
JOURNAL: FEMS Microbiology Letters 131 (1):p27-34 1995
ISSN: 0378-1097
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/18 (Item 17 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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10011862 BIOSIS NO.: 199598466780
Cloning and expression of the isopenicillin N synthase gene from Lysobacter
lactamgenus YK90.
AUTHOR: Kimura Hiroyuki(a); Suzuki Masaru; Sumino Yasuhiro
AUTHOR ADDRESS: (a)Dep. Biotechnol., Div. Pharm., Takeda Chem. Industries
Ltd., Yodogawa-ku, Osaka 532**Japan
JOURNAL: Journal of Fermentation and Bioengineering 80 (2):p118-123 1995
ISSN: 0922-338X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/19 (Item 18 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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09394262 BIOSIS NO.: 199497402632
The effect of compounds related to penicillin G biosynthesis on the in
vitro formation and bioassay of isopenicillin N.
AUTHOR: Meesschaert B D(a); Alvarez-Ruiz E; Martin J F
AUTHOR ADDRESS: (a)Lab. Biochem. Microbiol., Catholic Polytechnic
West-Flanders, Zeedijk 101, 8400 Oostende**Belgium
JOURNAL: Mededelingen Faculteit Landbouwkundige en Toegepaste Biologische
Wetenschappen Universiteit Gent 58 (4B):p1973-1980 1993
DOCUMENT TYPE: Article
RECORD TYPE: Citation
LANGUAGE: English

14/3/20 (Item 19 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

08981939 BIOSIS NO.: 199396133440
Investigations into the post-translational modification and mechanism of
isopenicillin N: Acyl-CoA acyltransferase using electrospray mass
spectrometry.
AUTHOR: Aplin Robin T; Baldwin Jack E; Roach Peter L; Robinson Carol V;
Schofield Christopher J
AUTHOR ADDRESS: Dyson Perrins Lab., Oxford Centre Molecular Sci., South
Parks Rd., Oxford OX1 3QY**UK
JOURNAL: Biochemical Journal 294 (2):p357-363 1993
ISSN: 0264-6021
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/21 (Item 20 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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08807077 BIOSIS NO.: 199395096428
Genes for a beta-lactamase, a penicillin-binding protein and a transmembrane protein are clustered with the cephamycin biosynthetic genes in *Nocardia lactamdurans*.
AUTHOR: Coque Juan Jose R; Liras Paloma; Martin Juan F(a)
AUTHOR ADDRESS: (a)Section Microbiol., Dep. Ecology, Genetics Microbiol., Fac. Biology, Univ. Leon, 24071 Leon**Spain
JOURNAL: EMBO (European Molecular Biology Organization) Journal 12 (2):p 631-639 1993
ISSN: 0261-4189
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/22 (Item 21 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

08795458 BIOSIS NO.: 199395084809
Characterization of a broad-range disulfide reductase from *Streptomyces clavuligerus* and its possible role in beta-lactam antibiotic biosynthesis.
AUTHOR: Aharonowitz Yair(a); Av-Gay Yossef; Schreiber Rachel; Cohen Gerald
AUTHOR ADDRESS: (a)Dep. Molecular Microbiology Biotechnology, George S. Wise Faculty Life Sciences, Tel Aviv Univ.,**Israel
JOURNAL: Journal of Bacteriology 175 (3):p623-629 1993
ISSN: 0021-9193
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

14/3/23 (Item 22 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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08524043 BIOSIS NO.: 199344074043
Enzymes for epimerization of isopenicillin N, ring expansion of penicillin N, and 3'-hydroxylation of deacetoxycephalosporin C: Function, evolution, refolding, and enzyme engineering.
BOOK TITLE: Annals of the New York Academy of Sciences; Enzyme engineering
AUTHOR: Yeh W K; Ghag S K; Queener S W
BOOK AUTHOR/EDITOR: Clark D S; Estell D A: Eds
AUTHOR ADDRESS: Lilly Res. Lab., Div. Eli Lilly and Co., Lilly Corp. Cent., Indianapolis, Indiana 46285**USA
JOURNAL: Annals of the New York Academy of Sciences 672p396-408 1992
BOOK PUBLISHER: New York Academy of Sciences, 2 East 63rd Street, New York, New York 10021, USA
CONFERENCE/MEETING: Eleventh International Enzyme Engineering Conference Keauhou-Kona, Hawaii, USA September 22-27, 1991
ISSN: 0077-8923 ISBN: 0-89766-764-6 (paper); 0-89766-763-8 (cloth)
DOCUMENT TYPE: Article
RECORD TYPE: Citation
LANGUAGE: English
?t/9/8

14/9/8 (Item 7 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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11097477 BIOSIS NO.: 199799718622
Genetic engineering of penicillin biosynthesis.
AUTHOR: Shorrocks Celia P(a); Sutherland J D
AUTHOR ADDRESS: (a)Dyson Perrins Lab., Oxford OX1 3QY**UK

JOURNAL: FASEB Journal 11 (9):pA884 1997
CONFERENCE/MEETING: 17th International Congress of Biochemistry and
Molecular Biology in conjunction with the Annual Meeting of the American
Society for Biochemistry and Molecular Biology San Francisco, California,
USA August 24-29, 1997

ISSN: 0892-6638

RECORD TYPE: Citation

LANGUAGE: English

REGISTRY NUMBERS: 1406-05-9: PENICILLIN; 58678-43-6: *ISOPENICILLIN N*

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Enzymology
(Biochemistry and Molecular Biophysics)

CHEMICALS & BIOCHEMICALS: PENICILLIN; *ISOPENICILLIN N*

MISCELLANEOUS TERMS: Meeting Abstract; ACTIVE SITE; BIOSYNTHESIS;

ENZYMOLGY; GENETIC ENGINEERING; *ISOPENICILLIN N*; ISOPENICILLIN N

SYNTHASE; PENICILLIN; STRUCTURE-ACTIVITY RELATIONSHIP

CONCEPT CODES:

10060 Biochemical Studies-General

10064 Biochemical Studies-Proteins, Peptides and Amino Acids

10506 Biophysics-Molecular Properties and Macromolecules

10806 Enzymes-Chemical and Physical

10808 Enzymes-Physiological Studies

00520 General Biology-Symposia, Transactions and Proceedings of
Conferences, Congresses, Review Annuals

?s apergillus(w)lovastatin

22 APERGILLUS

5536 LOVASTATIN

S15 0 APERGILLUS(W)LOVASTATIN

?s pump1 or pump2

0 PUMP1

2 PUMP2

S16 2 PUMP1 OR PUMP2

?t/3/all

16/3/1 (Item 1 from file: 155)

DIALOG(R)File 155:MEDLINE(R)

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04991358 87109197

Induction of tissue-specific proline-rich protein multigene families in
rat and mouse parotid glands by isoproterenol. Unusual strain differences
of proline-rich protein mRNAs.

Ann DK; Clements S; Johnstone EM; Carlson DM

Journal of biological chemistry (UNITED STATES) Jan 15 1987, 262 (2)
p899-904, ISSN 0021-9258 Journal Code: HIV

Contract/Grant No.: AM 36812, AM, NIADDK

Languages: ENGLISH

Document type: JOURNAL ARTICLE

16/3/2 (Item 1 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)

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05600289 BIOSIS NO.: 000083073429

INDUCTION OF TISSUE-SPECIFIC PROLINE-RICH PROTEIN MULTIGENE FAMILIES IN RAT
AND MOUSE PAROTID GLANDS BY ISOPROTERENOL UNUSUAL STRAIN DIFFERENCES OF
PROLINE-RICH PROTEIN MESSENGER RNA SPECIES

AUTHOR: ANN D K; CLEMENTS S; JOHNSTONE E M; CARLSON D M

AUTHOR ADDRESS: DEPARTMENT OF BIOCHEMISTRY AND BIOPHYSICS, UNIVERSITY OF
CALIFORNIA, DAVIS, DAVIS, CALIFORNIA 95616.

JOURNAL: J BIOL CHEM 262 (2). 1987. 899-904. 1987

FULL JOURNAL NAME: Journal of Biological Chemistry

CODEN: JBCHA

RECORD TYPE: Abstract

LANGUAGE: ENGLISH

?s lovastatin

S17 5536 LOVASTATIN

?s s17 and increase(w)yiled

5536 S17

1516937 INCREASE


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                22 YILED
                0 INCREASE(W)YILED
S18             0 S17 AND INCREASE(W)YILED
?s s17 and increase(w)yield
                5536 S17
                1516937 INCREASE
                312041 YIELD
                511 INCREASE(W)YIELD
S19             0 S17 AND INCREASE(W)YIELD
?s apergillus(w)nidulans and rho1
                22 APERGILLUS
                11695 NIDULANS
                1 APERGILLUS(W)NIDULANS
                402 RHO1
S20             0 APERGILLUS(W)NIDULANS AND RHO1
?ds

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Set	Items	Description
S1	541	SECONDARY(W)METABOLITE AND FUNG?
S2	0	INCREASE (PRODUCTION OR YIELD) AND S1
S3	0	INCREASE (PRODUCTION OR YIELD)
S4	312588	INCREASE(W)PRODUCTION OR YIELD
S5	23	S1 AND S4
S6	19	RD (unique items)
S7	0	ISOPENICILLIN N AND INCREASE(W)PRODUCTION
S8	4	CPCR1
S9	0	ISPENICILLIN N
S10	23	ISOPENICILLIN N
S11	0	S10 AND S8
S12	2451570	10
S13	23	S10
S14	23	RD (unique items)
S15	0	APERGILLUS(W)LOVASTATIN
S16	2	PUMP1 OR PUMP2
S17	5536	LOVASTATIN
S18	0	S17 AND INCREASE(W)YILED
S19	0	S17 AND INCREASE(W)YIELD
S20	0	APERGILLUS(W)NIDULANS AND RHO1

?logoff

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20may01 09:19:13 User259980 Session D118.2
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$0.95      1 Type(s) in Format 3
$3.00      2 Type(s) in Format 9
$3.95      3 Types
$7.48 Estimated cost File71
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$2.23 Estimated cost File434
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$0.20      1 Type(s) in Format 3
$0.20      1 Type(s) in Format 9
$0.40      2 Types
$1.75 Estimated cost File155
$12.68     2.265 DialUnits File5
$37.95     23 Type(s) in Format 3
$28.05     17 Type(s) in Format 9
$66.00     40 Types
$78.68 Estimated cost File5
OneSearch, 4 files, 3.332 DialUnits FileOS
$1.00 TYMNET
$91.14 Estimated cost this search
$91.57 Estimated total session cost 3.453 DialUnits

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Status: Signed Off. (20 minutes)